

What is claimed is:

1. A method to prepare a microporous outside-in PVDF hollow fiber membrane which is spun by immersion and coagulation, comprises:

a. preparing polymer solution by introducing the following material into a mixer, dissolving and stirring it at a certain temperature:

Polyvinylidene Fluoride	18-25%(wt);
Organic additives	22-25%(wt);
Inorganic additives	0.5-5.0%(wt);
Solvent	59.5-45.0%(wt).

b. extruding the said solution through outer tube of a double tube spinneret, and lumen forming composition liquid through inner tube of the same simultaneously;

c. obtaining original fiber membrane by introducing and immersing the extruded polymer solution as well as the lumen liquid into a first stage coagulation bath, and consequently into a second coagulation bath after quick evaporation, wherein a precipitation takes place via phase inversion in the said two baths respectively;

d. passing the original membrane through a rinsing bath, subjecting it to hydrophilic rendering; then an outside-in hollow fiber with double skins and complete spongy network is prepared.

2. The method of claim 1, wherein the said organic additives consists of at least two of the groups of polyvinylpyrrolidone, polyethylene glycol, polyvinyl alcohol, Tween and Triton; If the additives are more than two kinds, the total amount is constant.

3. The method of claim 1, wherein the said inorganic additives is selected at least one from the group comprising lithium chloride, lithium nitrate and sodium acetate solution; If the additives are more than two kinds, the total amount is constant.

4. The method of claim 1, wherein the said solvent is selected at least one from the group comprising N-Methyl Pyrrolidone, dimethylformamide, dimethylacetamide, dimethyl sulfoxide and triethyl phosphate; If the solvent is more than two kinds, the total amount is constant.

5. The method of claim 1, wherein the said lumen forming liquid comprising 10-80% by weight of solvent of PVDF, 5-30% by weight of alcohol and polyalcohol, 0.5-5% by weight of surfactant and other is deionized water.

6. The method of claim 1, Wherein the molecular weight(Mw) of the polyvinylidene fluoride resins ranges from 400,000 to 800,000 daltons, and a characteristic viscosity ranges from 1.65-2.00.

7. The method of claim 1, wherein the characteristic viscosity for the said PVDF resin is 1.75-1.85, the molecular weight of the said PVDF resin is 500,000 to 700,000 Dalton; if there is more than one kind of PVDF, the total amount is constant.
8. The method of claim 1 or 2 or 3 or 4 or 5 or 6 or 7, wherein the said organic additive is polyvinylpyrrolidone, having a molecular weight ranging from 11,000 to 1,000,000 daltons, and the concentration for the said organic additive is 22-25%(wt).
9. The method of claim 1 or 2 or 3 or 4 or 5 or 6 or 7, wherein the evaporation time is preferably ranging from 0.02s to 0.2s; the said first stage coagulating bath preferably comprises 40-80% by weight of solvent of PVDF resin in which the time of coagulation is 1.5s to 4.0s; and the said second stage coagulating bath preferably comprises 40-80% by weight of solvent of PVDF resin in which the time of coagulation is 4.0s to 120s.
10. The method of claim 1 or 2 or 3 or 4 or 5 or 6 or 7, wherein the said hydrophilic agent is selected at least one or more from the group comprising 10-80% by weight of propanetriol, 0.05-5% by weight of hydroxypropyl cellulose and 0.5-5% by weight of Triton.
11. The method of claim 8, wherein the said hydrophilic agent is selected at least one or more from the group comprising 10-80% by weight of propanetriol, 0.05-5% by weight of hydroxypropyl cellulose and 0.5-5% by weight of Triton.
12. The membrane of claim 1 or 2 or 3 or 4 or 5 or 6 or 7, wherein the said hollow fiber has double skins which are internal and external and a complete sponge network supporting layer in the cross-section; the external skin is denser than the internal one; the microporous hollow fiber membrane has an average pore diameter ranging from 0.01 $\mu$ m to 0.06 $\mu$ m, and water flux per unit wall thickness of 150 to 800L/m<sup>2</sup>.h.25 $\square$ .1bar, porosity of 70-85%, compressive strength of more than 0.5Mpa.
13. The membrane of claim 8, wherein the said hollow fiber has double skins which are internal and external and a complete sponge network supporting layer in the cross-section; the external skin is denser than the internal one; the microporous hollow fiber membrane has an average pore diameter ranging from 0.01 $\mu$ m to 0.06 $\mu$ m, and water flux per unit wall thickness of 150 to 800L/m<sup>2</sup>.h.25 $\square$ .1bar, porosity of 70-85%, compressive strength of more than 0.5Mpa.